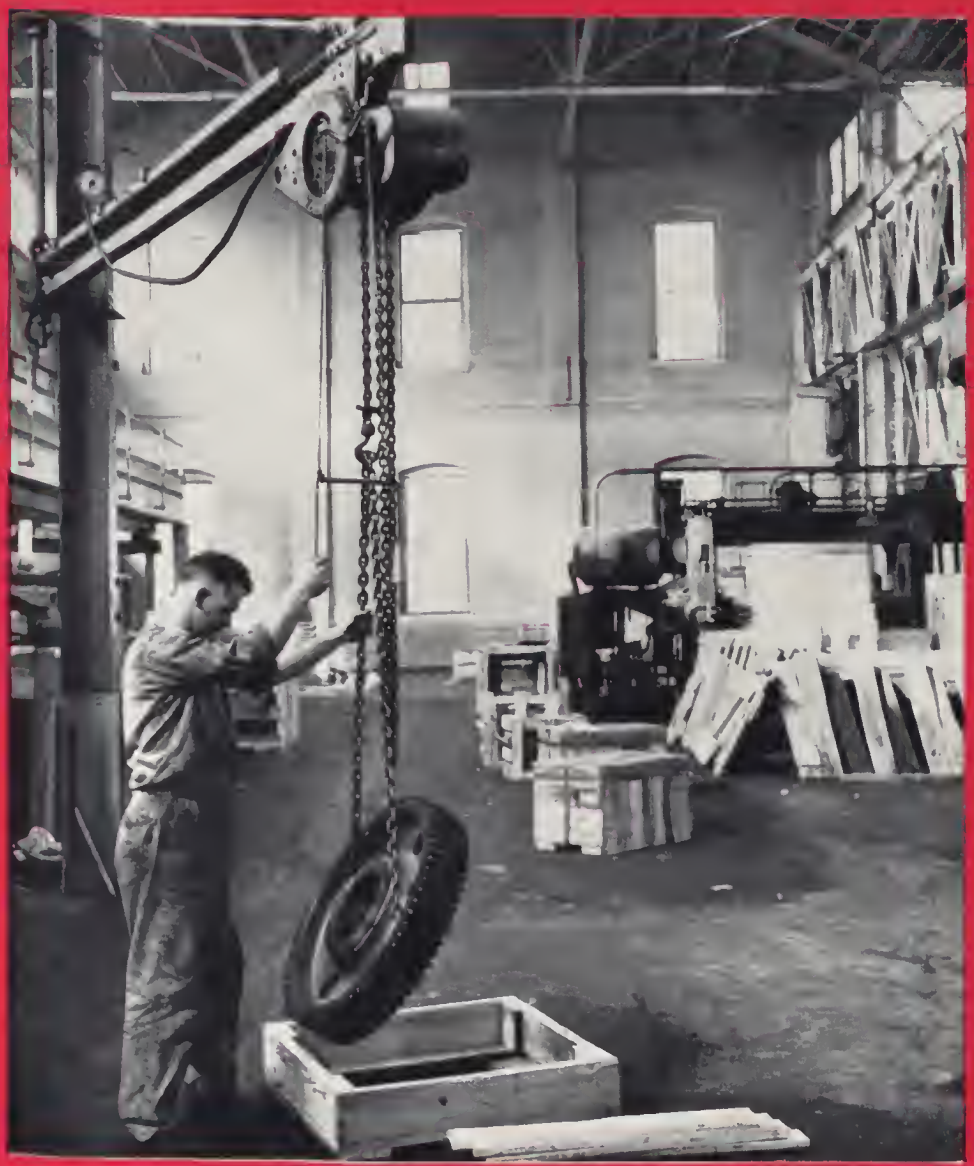
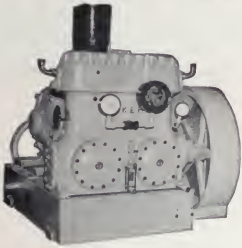
the Mechelecty

VOL. 10 DECEMBER 1950 NO. 3



THE SCHOOL OF ENGINEERING
GEORGE WASHINGTON UNIVERSITY

Another page for **YOUR BEARING NOTEBOOK**



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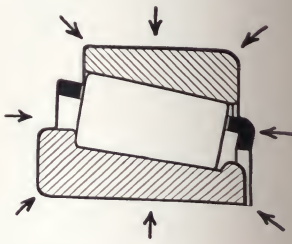

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THE MECHELECIV

Published at the George Washington University by direction of the Engineers' Council. Published six times during the school year in October, November, December, March, April and May. Subscription price: One Dollar

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• THE PROGRESSIVE APPROACH

During November one of the professors in the Civil Engineering department arranged, through the cooperation of the American Bridge Company, a field trip for Civil Engineering students in the higher grades to a bridge project. While there have been many such trips in the past, none has caught the student interest so successfully as this trip to the Delaware Memorial Bridge at Wilmington, Delaware.

The Delaware Memorial Bridge has many features which make it outstanding to the structural engineer. It will be, when completed, the third longest span in the world. It is planned as a link in the new coastal through highway route from Maine to Florida. In addition, it is not a local project which the average student sees every day on his way to classes.

While the inspection trip lasted only one day, it was an opportunity for the serious student to learn a great deal about the construction methods, as well as the personnel, of a large modern company. The American Bridge Company has the contract for the fabrication and construction of the steel superstructure, and the methods used by that firm are a very good example of modern techniques.

It was impossible, of course, for every student in the department to attend. For the majority of the students in the first two years, however, it would have been difficult to gain a proper appreciation of the pertinent facts, and the trip would have meant little. For the Juniors and Seniors, it was a trip of great value.

This kind of progressive approach to the creation of understanding on the part of the students can make the difference between dull and lackadaisical students and wide-awake, enthusiastic young engineers. We believe that Professor Miklofsky and Assistant Dean Wather are due a very large bouquet for their efforts to make this trip the success which all of the Civil Engineering students feel that it was.

• PRACTICAL EDUCATION

Recent news items, two of which are reported in this issue, seem to indicate that the students of the School of Engineering are beginning to take a much more active part in the affairs of the University as a whole than has been the practice in the past. Not only are the engineering students showing this additional interest, but the other University students are accepting the participation of the engineers in a manner which really makes it worthwhile.

The Theta Tau float entered in the halftime festivities at the Homecoming Game was an excellent example of the type of participation which can help to build spirit, and winning a prize for this entry isn't half as important as the feeling engendered in the general student body by the show of interest.

Of course, it is perhaps going too far to suggest that the float had anything to do with the outcome of the class elections. But, certainly it is unusual for a single group to elect a full slate to the Senior Class offices, and it is particularly unusual for the Engineering students to be the group who can muster four senoirs so well-known on campus as to win the election.

The administration of affairs of the more important posts on campus, such as these senoir class offices cover, and such as the Student Union Board, which an engineer won in the elections last spring, is an excellent background for a young engineer to carry to his first job in the business world. It is not an accident that a large number of the top management positions in major industrial concerns are held by engineers (or men whose initial training was in engineering). The engineering training a young man receives in college has a distinct method of thinking as a basis. The ability to analyse a problem and arrive at a solution in steps is an integral part of our everyday studies, and it is also an integral part of successful administration of any post. Those students who recognize this and start to apply it in college have already gone a long step toward management of their own personal careers.

ENGINEERING SCHOOL CALENDAR

December 1950

December 6—Wednesday—Joint Meeting of Engineering Societies, 8:15 p.m., Hall of Gavernment

December 13—Wednesday—Sigma Tau Meets, Room C-200

December 16—Saturday—Sigma Tau Banquet

December 18—Monday—Christmas Tree Lighting Ceremony, Lisner Terrace, 7:00 p.m.

December 20—Wednesday—Theta Tau Meets, Room D-200

December 25—Monday—Merry Christmas Everybody!

AN APOLOGY:

We have been informed by the Calumbia Quarterly that the article "An Intemperate View of Undergraduate Education," by Walter La Pierre, which appeared in our May 1950 issue, had previously appeared in that magazine, and was copyrighted by them.

We regret our error, and take this opportunity of giving credit to the original publishers of this article.

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About our Cover

This jib crane with a half-ton electric hoist expedites the crating of heavy gears at the Gearing Division of the Westinghouse Electric Corporation, Pittsburgh, Penna. It is simple to operate and precludes damage to the accurately hobbed gear teeth.

from the editor's mailbox

This space is intended to serve as a forum for student and alumni opinion. Opinions expressed are those of the writers, and not necessarily those of the MECHELECIV. *Address communications to: Editor's Mailbox, the Mechelociv, Student Union Annex, George Washington University.*

—THE EDITORS.

November 16, 1950

Dear Editor:

A problem which has long bothered the societies and fraternities of our school was emphasized at the last meeting of Sigma Tau, on November 8. This is the problem of attendance. Those present at the meeting were, as usual, the same members who took an interest in the Fraternity's affairs and in the projects. But the balance who were not at the meeting, all of fifty per cent, display by their absence an apathy toward fraternity activities.

This was also discussed as a common problem among delegates at the conclave in Lawrence, Kansas, from which our president has just returned. There is no reason, however, why Xi chapter should suffer in the same way that other chapters do, when we consider the success which other campus societies are having in setting new records of attendance and membership.

It seems to me that from the example of activity of a large number of engineering students, that the excuse which starts out, "I don't have the time . . ," no longer should be considered valid. It is somewhat ironical to observe the splendid attendance which always turns up at meetings when the prospective members are pledged and when yearbook pictures are taken. Sigma Tau has very definite purposes in our school, and it is up to every member to uphold them by his attendance.

Sincerely,
E. Nehru.

• *This is a problem which every activity must face, and one of the best solutions seems to be a live program that encourages student interest.* —Ed.

Dear Editor,

Word will get around! Even if it's about something nice that somebody did. In other words, congratulations to your professional fraternity, Theta Tau, for their thoughtful gesture to the "Street Scene" cast.

Sending flowers to the girls of the show is hardly a unique procedure generally, but it seems to be around here, and I, for one, am glad to see it being practiced to such a degree by your outfit.

It's true two other groups, both social, remembered the cast, Phi Sig with a party for them, and Chi O with a bouquet to its member and star, Lynn Clark; but why so few?

I only hope this gets to the attention of some influential people who will plan future courteous acts to help revive the sadly dying days of chivalry which should have never been allowed to die.

I grant that this is a modern age and the idea of thinking of other people has just about passed on; all the more reason why small acts of pure thoughtfulness should be practiced and deserve commendation when practiced.

Sincerely,
Rustye Woods

• *Thank you, Miss Woods, on behalf of Theta Tau. Two of our staff members were in the cast of Street Scene and were present when the girls received the flowers. We agree that it was a very nice gesture.—Ed.*

Lightning Protection of Distribution Systems

by Ellis R. Packer

1950 Graduate in Electrical Engineering

Continual research in the laboratory and in the field on lightning and its effects on circuits and apparatus has established the fundamentals of lightning protection so well that the careful selection and application of modern arresters will provide distribution systems with a really high degree of immunity from lightning troubles.

Adequate lightning protection of distribution systems depends upon three major considerations:

1. The selection of distribution transformers and other distribution equipment that have an insulation strength to lightning voltages not less than present-day basic insulation levels.
2. The selection of arresters which are so efficient that they will limit the lightning stresses to a value well below the standard impulse-test level of the apparatus.
3. The effective application of the arresters, by mounting them in close shunt relation with the apparatus to be protected, and, wherever possible, interconnecting the primary arrester ground to secondary neutral. To minimize primary-fuse blowing at the transformer, the fuse should be on the transformer side of the arrester, so that the lightning-discharge current passing through the arrester does not pass through the fuse.

Basic insulation levels, as well as standard ASA and AIEE impulse-test levels, demonstrate that the primary winding of a 6900- or 7200-volt distribution transformer must withstand a 1.5 x 40 ms impulse, full-wave test of 95 kv crest and a chopped-wave test of 110 kv crest.

Conservative protection for a distribution transformer throughout its service life generally requires that the repeated lightning stresses be limited to approximately 50 per cent of the standard ASA impulse-test level. This takes into account the effect of repeated lightning stresses on solid or composite solid-and-oil insulation (basic insulation level), as well as operating conditions to which distribution transformers are subjected (possible depreciating effects on new insulation by overloads, moisture effects, absence of periodic maintenance, filtering of oil, etc.).

The adequate margin of protection should be based upon the most severe discharge currents that may be reasonably expected on distribution circuits.

It is noted that a liberal margin can be provided at which the arrester protection level (even at the higher lightning currents to be considered) is below strength of these transformers when new. Similarly, large margins of protection can be obtained in the other distribution-circuit classes.

The wave of impulse voltage allowed by different lightning protective devices varies. For instance, plain gaps or gap-type devices for 6900-volt service have an impulse level similar to that of a 2-inch rod gap, and hence require a relatively high impulse-sparkover voltage to start discharge. Discharge is followed by a low arc-drop voltage after sparkover, while discharge current is flowing. (If gap has series resistor, IR voltage drop will occur after gap sparkover.)

The lightning arresters should limit the lightning stresses to the lowest practicable value. This can be realized for any protective device by interconnection of the primary arrester ground to the grounded secondary neutral. The total length of interconnection lead (from primary bushing of the transformer, through the arrester and interconnection circuit, to secondary neutral) should be kept to a minimum, and preferably should not exceed 10 feet.

For protection of other apparatus, arresters should also be located in close shunt relation to the apparatus to be protected. For example, arresters protecting metallic-sheathed cable should be installed at the cable pothead with the arrester ground tied into the cable sheath (right at the pothead), and thence connected to ground at the base of the pole.

It is desirable to connect the arrester on the line side of the primary fuse, so the lightning-discharge currents can pass through the arrester to ground without having to pass through the fuse.

To limit the impulse current's passing through, and possibly causing the blowing of sectionalizing fuses, distribution arresters should be connected one or two pole spans away from and on either side of the sectionalizing fuse. This is to make certain that the arrester which is located in the path of the incident wave will discharge before the arrester on the other side of the fuse.

During discharge, valve-type arresters permit POWER-FOLLOW CURRENT of only a few amperes for a half-cycle or less insufficient to blow even the lowest-rated fuses. Plain discharge gaps cause a short circuit, following a lightning discharge or shorting by birds, and the short-circuit current persists until a circuit breaker, section fuse, or some other fault-interrupting device opens the circuit. Enclosed or arc-expulsion gaps place some restrictions on fuse

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Latrobe's Folly

by Alfred B. Moe
Undergraduate in Civil Engineering

In the same year that Peter Cooper raced his gun-barrel-tubed steam locomotive "Tom Thumb" against a horse, and lost, another event of historical significance was taking shape in the same vicinity. The Petapsco River gorge at Relay, Maryland, nine miles south of Baltimore, was a serious obstacle in the path of the proposed extension of the Baltimore and Ohio Railroad into the Nation's Capital. That railroad's most capable engineer, Benjamin Latrobe, had just completed plans to bridge the valley. He had designed a 700 foot stone-arch bridge patterned after the ancient structures so successfully built by the Chinese and Romans.

Engineers and others were unimpressed with Latrobe's design for this bridge and were of the opinion that he had overstepped the boundaries of common sense even to consider a structure which, they claimed, would fall of its own weight. However, he turned a deaf ear to his critics and hired a stone mason without peer, one John McCartney, of Ohio, who proceeded at once to sling the bridge across the valley. At the same time he modestly erected a fifteen foot granite shaft to perpetuate his achievement in building this viaduct.

The Thomas Viaduct, as the bridge is now called, is a beautiful, graceful monument in stone to a great engineer. It was built on a four-degree curve and contains eight elliptical arches sixty feet wide towering sixty five feet above the stream. Twenty-four thousand cubic feet of native rock were used to build this structure, originally designed for six-ton locomotives. It is now safely supporting the 300-ton giants of today pulling the great, heavy mainliners of the B & O system. The first bridge of this type to be used by the railroad, it was planned in 1830 and completed in 1836.

When the greatness of this feat of bridge building is considered, it must be remembered that the increasing weight of locomotives and trains at that time demanded bridges that had never previously been considered. There was a need for materials whose strength properties could be easily and accurately measured. Prior experience with highway bridges was of little worth, since the loads they had to support at that time resulted in stresses scarcely greater than those from the dead weight of the bridge alone.

A stone-arch bridge is simple to construct and inexpensive to maintain. However, the initial cost today is high in comparison with other types. Back in 1830 there were no other types of any importance. True,

(Continued on page 17)

The B &O Railroad's New Columbian on the Thomas Viaduct, Relay, Maryland
Taken in 1949, this photo shows two units of 1500 HP each.

Intercarrier Sound System

by Lynn W. Garrison

Undergraduate in Electrical Engineering

According to existing standards regarding the transmission of television signals, a separate transmitter is employed for the video system and another one for the sound system. The carrier frequency of both the video and the sound channels must be maintained nearly constant as prescribed by the Federal Communications Commission. The stablilty of both must be maintained within a tolerance of plus/minus 0.002 per cent. These carrier frequencies from the transmitter, regardless of the television channel being used, must be separated by 4.5 megacycles to conform to FCC standards. This 4.5 mcs plays an important role in the intercarrier system.

Due to this close spacing of video and sound carrier frequencies, receivers today are manufactured with a single front end (RF amplifier, high-frequency oscillator, and mixer) common to both the video and sound signals. In other words, the RF amplifier and mixer stages of the front end contain tuned circuits for each television channel that are broad enough to receive both signals and their accompanying sidebands. The bandwidth of each channel must be at least 6 megacycles in order to receive all of the video and audio intelligence. The high-frequency oscillator beats with both the video and sound signals inside the mixer tube.

Due to the heterodyning action inside the mixer tube, the plate circuit contains many different frequencies. The frequencies primarily of interest are those that are the difference between the oscillator frequency and the video and sound carriers—the so-called intermediate frequencies of the receiver. No matter to what channel the receiver is tuned, the high-frequency oscillator is so adjusted that the video and sound intermediate frequencies are the same for all channels. The 4.5 mc difference is still maintained in the output of the mixer stage.

In the conventional receiver, which does not employ the intercarrier system, the output of the mixer stage is fed to two different tuned circuits. One of these circuits is tuned to the sound intermediate frequency while the other is tuned to the video intermediate frequency. These two signals are thus separated in the output of the mixer stage. These two signals are then amplified in separate intermediate frequency amplifiers after which the intelligence is removed from these IF frequencies in separate detectors. The video frequencies being amplitude modulated at the transmitter, are detected by a conventional diode detector. The sound channel must employ a discriminator or a ratio detector in that "frequency modulation" is employed. The discriminator or ratio detector, which ever is used, must be adjusted to the center frequency which corresponds to the sound carrier frequency. The intelligence to be removed is found in frequencies on either side of the center frequency and for faithful reproduction this center frequency must be maintained constant. In practice, however, it is found that the oscillator frequency drifts with temperature changes and ageing which make it nearly impossible to maintain a constant sound IF. The result is a distorted output in the loudspeaker.

In the inter-carrier system the output of the mixer tube is fed to but one tuned circuit, the video channel. This video intermediate frequency will also be accepted and amplified along with the video signal. In other words a common IF amplifier amplifies both the signal IF and the video IF. Both frequencies are fed to the video detector, the video intelligence being removed as in the conventional system.

In that the signal from the transmitter contains two parts separated by 4.5 mcs, the IF signals in the IF amplifier will also be separated by 4.5 mcs. The output of the video detector will contain a 4.5 mc beat note together with the sound intelligence. This 4.5 mc signal is taken from the output of the video detector, with the aid of a tuned circuit, and fed to the sound detector. This sound detector must, as previously stated, be a discriminator or ratio detector which are detectors that remove intelligence from carrier frequencies that are frequency modulated. As explained above, the discriminator or ratio detector must be adjusted to the center frequency, in this case 4.5 mcs. This 4.5 mc carrier, the output of the video detector is frequency modulated with the sound to be fed to the loudspeaker. The sound detector will thus respond to the intelligence and by so doing will remove this intelligence from the 4.5 mc carrier. As stated in the beginning, the 4.5 mc separation between video and sound carrier frequencies must be maintained within very close limits. No matter whether the oscillator in the receiver drifts or not this 4.5 mc difference will be maintained at all times. This means that oscillator drift will not affect the sound detector or subse-

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Engineers Win Elections

On November ninth and tenth elections of class officers for the present academic year were held at the George Washington University, with an all-engineers' slate taking the four Senior Class offices in a landslide. John Lewis, an undergraduate in Civil Engineering, was elected senior president; Edward McGandy, an undergraduate in the Bachelor of Science curriculum, is the new vice-president; Marjorie Townsend, an undergraduate in Radio Engineering, was elected secretary; and James Hampton, an undergraduate in Electrical Engineering, won out as treasurer.

The engineers have been successful in filling two important campus posts in recent years, prior to the present election. Fremont Jewell was voted into the presidency of the Student Council in a hotly contested race in 1947, and Tom Mutchler was elected chairman of the Student Union Board in the spring of 1949.

Most of the candidates campaigned vigorously during the recent election. They availed themselves of the usual vote-getting stunts; there were persistent shouting, bizarre costumes, and catchy posters. The engineers were equally persistent, but there was a note of seriousness from them. As the seniors passed 21st and G streets, the engineers distributed to them a mimeographed resumé of the candidates qualifications and their platform for the senior class.

The eight-point platform proposed action to provide for a useful gift for the University from the class of 1951 and to encourage the establishment of this practice as a tradition at the University; it favored annual class dues, and promised to foster closer alumni-student relations. The candidates pledged themselves to attempt to get final approval for the new class ring designs for the Law School and the School of Engineering. They also hope to hold more meetings, to have a big senior prom this year, and to encourage more large firms to come to the university for interviews with the seniors.

Some of the students of the School of Engineering have optimistically started considering the possibility of entering a candidate for the Student Council elections, which will be held in May. From the trend in the last two elections, the engineers should have a good chance of gaining an office in the Council.

District AIEE Meets Here

AIEE branch members had a busy weekend on Friday and Saturday, November 3rd and 4th, when they were host to more than a hundred delegates from 25 colleges and universities located in the eastern part of the country. The occasion was the annual meeting of student chairmen and faculty counselors from each student branch in the Middle Eastern District of the AIEE. Assistant Professor Jerome S. Antel, the George Washington University faculty counselor, presided at the conference of faculty counselors and Lynn Garrison, the local chapter chairman, led the meeting of the student chairmen.

After the conferences on Friday, the out of town visitors were taken on an inspection tour through the National Bureau of Standards. The day was topped off by a banquet at the "400" Restaurant where the featured speaker was Dr. Eugene Crittendon, Senior Associate Director of the National Bureau of Stan-

(Continued on page 18)

The collegiate delegates and chapter advisers of the Eastern District of the AIEE pictured at the recent conference held at Lisner Auditorium.

Only STEEL can do so many jobs

PRELUDE TO A SQUARE MEAL. Today, about 12½% of our population works on farms and ranches, supplying food for America and the world. And steel, more than any other material, has helped to make their work easier, their production greater, their lives pleasanter. For steel not only gives them strong, weather-proof roofing and siding for farm buildings like these, (U·S·S Stormproof and U·S·S Tenneseal are famous names in rural areas) but helps to bring them modern farm machinery and equipment, the blessings of electricity, fast transportation and scores of other benefits.

THE CAP IS THE CLIMAX. Many of the things we need to keep us healthy and happy these days come to us in handy, closed containers. And the caps, or closures, of these containers are actually the climax to a painstaking effort on the manufacturer's part to keep the container's contents pure and safe. Last year, 3,592,563,699 of these closures were used in America—many of them made from U·S·S Tin Plate . . . steel with a very thin coating of tin.

KEY TO BURIED TREASURE. This is a rock bit, the steel drilling tool that chews its way down through the earth to tap our deeply-buried treasures of oil and gas. For such bits, U·S·S Alloy Steels supply the super-strength, the extra toughness, the high resistance to impact, shock and abrasion needed for drilling to great depths.

so well...

STORM WINDOWS LAST A LIFETIME. When your storm windows are made of U·S·S Stainless Steel, they're an unmixed blessing. They cut fuel costs, increase room comfort, of course. But what's more, they're corrosion-resistant, won't warp, bend or twist; they never need painting; they last a lifetime!

ROAD SEPARATOR THAT TALKS. Supplying reinforcing steel and cement for modern highways is one of the important jobs of United States Steel. Making highways safer is another one. This traffic lane marker, developed by Universal Atlas Cement, does double safety duty. Made of Atlas white cement, it is clearly visible at night. And its corrugated design (inset) actually causes it to sound a plainly-audible warning should you veer out of lane and your car tires ride on the corrugations.

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ALUMNEWS

Merwyn K. McKnight, BS in ME 38, BEE 41, is trying to build up the Engineering Alumni Association. To help in this, the alumni office is preparing a new roster of engineering graduates. Since they are having trouble finding some of the current addresses of graduates, Pop would appreciate it very much if everyone would send in a penny post-card to the alumni office with his name, address, telephone number, and position now held. Let's all help Pop and the other alumni officers with this project. Send the cards to Lester Smith, at the Alumni Office, 2018 Eye Street, N. W.

Bill Ellenberger, BEE 30, BME 34, has just returned from Boulder, Colorado, where in his capacity as Facilities Planning Engineer for the Bureau of Standards, he was planning the establishment of the Bureau's new Radio Laboratory at Boulder. Bill was busy planning exactly what would be required in the laboratory; floor space, special pipes, special circuits, etc. An interesting fact about this station is that the land for it was bought by the people of the area and given to the government for the laboratory.

Martin Mason, BCE 31, Chief of Engineering and Research Branch of the Beach Erosion Board, Army Department, tells us that *Eugene Dedrick*, BME 38, who at one time was working for Martin, is now running his own business, the Coast Surgical Supply Company, in Pasadena, California.

Word comes to us that *Harry Crosswell*, BME 50, is now a Production Engineer for the Big Jack Manufacturing Company, at Bristol, Tennessee-Virginia.

Richard Bartik, BME 50, is leaving his job as Laboratory Engineer at the Washington Gas Light Company to go with Electronics Laboratories, Incorporated, in Arlington, Virginia.

Joe England, BCE 36, is still at the Geophysical Laboratory of the Carnegie Institution of Washington. Between seismic field trips, he is writing up his gravity-measurement research of a few years ago.

Dick Daniels, BEE 50, is with the Minneapolis-Honeywell Regulator Company, and is at the moment at the Brown Instrument Division School for their sales trainees in Philadelphia. He is there to learn about the various devices manufactured by the industrial division of the company. Around the fifteenth of December, he will come back to the District and be married on the twentieth. He is going to be assigned to Washington to work, contacting government laboratories.

Chuck Meyers, BEE 49, is now with the Vickers-Sperry Company.

Stanley Machen, BCE 44, Sigma Tau, Theta Tau, is now in the surveying business in Prince George's County. If any of you have any surveying you want done, give Stan a call. (There will be a slight charge for the plug, Stan).

William Wroblicka, BEE 49, spent the last three months in Power Transformer Test with General Electric and is now assigned to the Distribution Transformer Design Engineering Division in their Pittsfield, Massachusetts, plant.

Bill Whittemore, BEE 50, says his job with Brush Development Company keeps him moving around the country. Bill just returned from a trip to the Cleveland plant and to the Naval Base at Cincoteague, Virginia.

Ivan Bell, BME 49, is an employee of Fred S. Gichner Company, a sheet metal firm in town which makes truck bodies. Ivan designs these bodies. In fact, we hear Ivan has designs for all types of bodies.

Lewis J. Dawson, BEE 37, has moved from Chevy Chase to Phillipsburg, New Jersey, where he has a very good position with Ingersoll Radio Company.

UNDERGRADUATE

During the past five years the male students of the School of Engineering have had demonstrated to them that not only can a woman compete with them in the engineering curriculum, but that she can be an outstanding success in this endeavor. The young woman who has held her own scholastically in addition to achieving a remarkable record in extra-curricular activities is Marjorie Rhodes Townsend, an Electrical Engineering student majoring in the Communications option.

Born on March 12, 1930, Marjorie received her early education in two private schools and for a short time in the District of Columbia public schools. After finishing the ninth grade at Holton Arms, she attended Central High School for a year and a half. While there she was active in the French and Red Cross clubs, and the girl cadet corps. From the Clifton Street school she transferred out to Wilson High School, and there completed her secondary school education at the tender age of fifteen. At the latter institution she participated in the activities of the Mathematics, French and Science clubs and worked on the Wilson Year Book.

During the summer following graduation in 1945 Marge worked at the Department of Terrestrial Magnetism Laboratories on Broad Branch Road, which is a branch of the Carnegie Institution of Washingon. She tells us that she worked there because "it was just around the corner from my house." In October, 1945, she began her eventful career here by enrolling at the University as an EE, joining the AIEE, the Canterbury Club, the MECHELECIV staff as feature editor, and pledging Sigma Kappa sorority. By the end of the year she had become Secretary-Treasurer of the AIEE, Editor of the MECHELECIV, and a member of the IRE.

During this early part of her stay at George Washington, she renewed her acquaintance with Chuck Townsend, who had been a fellow Wilsonite. In February of 1948, she was elected Queen of Hearts of Sigma Phi Epsilon, Chuck's fraternity. June of this same year found her marrying Chuck, who is now a student in the School of Medicine and will graduate in May, 1951. After that he expects to spend about five years in internship, meanwhile continuing his studies to become a specialist in obstetrics and gynecology. During this period Margie expects

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Among the outstanding alumni of the University, few have become as prominent in their field as has Charles H. Tompkins who, for the past 28 years, has been President of the construction company which bears his name.

Charles Hook Tompkins was born in Baltimore, Maryland, on November 30, 1883. He attended McKinley High School in Washington, where he played baseball and was captain of Company C, High School Cadets. Upon graduating from McKinley he was awarded the only scholarship given to the Washington high schools by Lehigh University. He entered Lehigh in 1903, and while there worked as steward of an Eaton club and addressed envelopes to earn part of his expenses. He entered the George Washington University in 1905, attending night school, and worked for a railroad in the day, later working for the District Government.

After leaving the University, Mr. Tompkins worked for the Ohio Electric Railway Company in the middle west and later for the Capital Traction Company in Washington. He began work as a construction engineer under his own name in 1911 and founded the Charles H. Tompkins Company in 1922, serving as President of that company since then. In 1906 he married Lida R. Tompkins, and they have four children, Charles H., Mrs. Andrew Parker, Francis M. Tompkins, and Mrs. Malcomb Matheson, Jr.

Among the prominent projects constructed by the Tompkins company are the Dalecarlia Filtration Plant, Bainbridge Naval Training Station, Ft. Belvoir Cantonment, Allegheny Ordnance Plant, White Oaks Naval Ordnance Laboratory, Garfinckel Department Store, Tower Building, and the District of Columbia National Guard Armory. The Scottish Rite Temple, several buildings at the George Washington University, and Naylor Gardens housing development were also built by this company, which is presently constructing the Wyatt Building and the New Federal Court House, all in Washington, D. C.

In addition to the presidency of his firm, Mr. Tompkins is a director of the Woodward and Lothrop Company, a director of the Riggs National Bank, governor and past president of the Washington Building Congress, director and past president of the Masterbuilders Association, life member of the American Society of Civil Engineers, member of the Society of American Military Engineers, a thirty-second degree

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● On Wednesday, November 1, the George Washington University branch of the American Institute of Electrical Engineers held its first regular meeting of the year. Guest speaker for the occasion was Mr. R. L. Ware, who spoke on the subject "The 22 kv Network in the Potomac Districts." Mr. Ware, who is Superintendent of the Potomac District of the Virginia Electric Power Company, told the branch members present that the 22kv system being installed in the Alexandria and Arlington areas was designed to provide subscribers with the highest quality of service. "When this installation is completed," said Mr. Ware, "no station in the network will be interrupted by a fault on the lines." Mr. Ware was introduced by student member John St. Clair.

At the business meeting following Mr. Ware's talk, Harold Gersten was elected vice-chairman in place of Lynn Garrison. Lynn moved up into the post of chairman earlier in the semester when it was learned that our chairman-elect, Bob Zens, was not returning to school.

The local student branch was host on November 3rd and 4th to students and faculty members from the Middle District Conference.

Actives and alumni of Gamma Beta chapter of Theta Tau were hosts to prospective members at a picnic in Rock Creek Park on November 11. Bob Cashman served again as chef, boiling up a shrimp feast for the crowd after the annual football game between the actives and the alumni. No one seems to remember the score in the game, but there were many comments on the quality of the shrimp.

A further party for rushees was held by the chapter on November 25. There were several alumni present. The alumni have invited the actives and pledges to a stag party at the Engineers' Club on Saturday, December 9. This seems to be on the way to becoming an annual affair, and is an opportunity for the undergraduate engineers to meet some of their brothers who have already started on their careers in the field of engineering.

An innovation in the program of Theta Tau this year occurred when the chapter entered a float in the half-time Mummer's Parade at the Homecoming Game with the South Carolina Gamecocks. While the float did not win a prize, it provoked a considerable amount of favorable comment. Theta Tau pledges have always assisted in projects of the Engineering School, such as the Christmas Tree lighting ceremony but this is one of the first times this has been extended to include all-University events.

On December 27th to 29th, the Biennial National Convention of Theta Tau will be held in Kansas City, Missouri. Gamma Beta chapter will send one delegate to the convention, and one alternate.

● The last meeting of the ASCE was held on Wednesday, November 1, in Gov. 202. The guest speaker was Mr. Hunter of Public Buildings Services who spoke informally on "Engineering in Russia and Opportunities Overseas." A sizeable group was present to hear this interesting talk.

The first committee appointed this year by President Bernie Crummett is the professional registration committee which is to be headed by Tom Cavanagh. This committee is responsible for obtaining information from a given State in the Union concerning qualifications for professional registration in that locality. Any one who wishes to be informed of such a matter contact the committee chairman.

Dean Walther announced at the November meeting that the DC section of ASCE will award every year to one civil engineering student in his senior year at George Washington University a prize amounting to about $40. Qualifications for this award are the following: promise of future success, scholarship, participation in activities, service to student chapter, character, and personality. The first award will be made in October, 1951. Judges for the award are the Dean of Engineering, Dean of Civil Engineering, and a Member of the Board of the DC section.

The December 6 meeting of the ASCE will be a combined meeting with the other professional societies. Dr. W. L. Everett, Dean of Engineering of the University of Illinois will be the guest speaker.

● Sigma Tau held a meeting November 8 in C-200. In addition to the usual order of business, the model project was discussed. Various members of Sigma Tau have volunteered to work on some project during their spare moments—if such is possible—for which they should be highly commended. A few models have been completed and others are in varying stages of completion.

President Chester Bilinski, who represented the Xi Chapter at the National Conclave held this past October 19-21 at Kansas University, Lawrence, Kansas, gave an oral report about the Conclave. He gave a brief description of the University, the meetings, and the matters brought up at the meetings.

A highlight of the Conclave, however, was the initiation of Mr. Paul H. Robbins, Executive Director of the National Society of Professional Engineers, consulting engineer, author of textbooks, and teacher, into Sigma Tau. He will be a member of our Xi Chapter.

Plans are now being made for the initiation banquet to be held December 16 and we will be looking forward to having as successful an affair as we have held in the past.

● On the night of November 9th, sixty of George Washington's potential mechanical engineers attended the annual smoker sponsored by the Washington Section of the American Society of Mechanical Engineers. The smoker is used as a mixer by the downtown section of ASME for the graduate engineers in the area and the mechanical engineering students of the various colleges in the area. About 200 students from GW, Maryland, and CU, were present plus a like number of graduates. The beer was plentiful, the food was good, and the entertainment was excellent. It was a good "night out" and should occur more often.

There will be a regular business meeting of the branch at the conclusion of the talk by the speaker in Gov. 101. A new representative will be elected to the Engineers' Council at this time. The office will be for a period of one year. Only one representative will be elected at the regular elections in May. This change in election procedure was made in order to have at least one half the total membership of the Council familiar with the operation of the Council.

Due to the expected graduation of Dick Keister in February, the office of secretary in the student branch will be vacant. Members interested in running for this position should be present with their support at the January meeting.

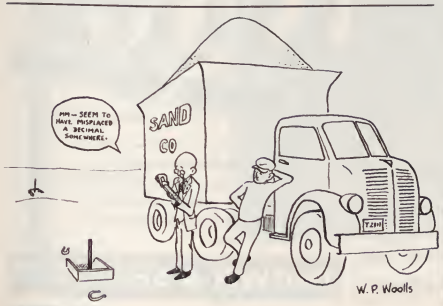
The National Conference of the ASME took place in New York City on the 29th and 30th of November. It was attended by Bob Curtis and Frank Yeide, along with Professors Cruickshanks and Trumbull. They returned on the 31st of November after a very interesting and profitable Conference.

● The Institute of Radio Engineers held its first meeting of this school year on Wednesday, November 1, in the Hall of Government. The guest speaker at this meeting was Mr. Grote Reber who spoke on "Radio Astronomy." An interesting part of his talk was about his trip to Alaska to study radiation condition during the total eclipse of the sun. The most important part of the business meeting was the election of the chairmen of the various committees who have already begun their work.

The next meeting will be a joint meeting with the other professional societies. The guest speaker, who will be presented by the Engineers' Council, is Dr. W. L. Everett, Dean of Engineering of the University of Illinois. All engineers of all classes must attend this meeting which is to be held on Wednesday, December 6, in Gov. 101. There will be no business meeting after the speech.

It should be mentioned here that Bob Spitler was elected to the Engineers' Council at the last meeting to take the place of Paul Couper who left the school in favor of the U.S. Marines—voluntarily or involuntarily?

All IRE's must know that out of 127 engineering schools in the country, GW ranks 19th in IRE student membership. So all you guys who haven't joined yet come on out and help make it better!



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dards. Dr. Crittendon spoke to the delegates on the subject of opportunities for engineers in the government service.

The final event of the program was the joint conference of counselors and chairmen held in Lisner Auditorium on Saturday morning with Professor Antel presiding. Many views were exchanged and grievances expressed. The meeting was held to be a big success.

Seven new members of Theta Tau shown at initiation in Lisner Auditorium, October 21.

ODK Taps Engineer

Thomas E. Mutchler, undergraduate of the School of Engineering, was among the five new members initiated by Omicron Delta Kappa, senior men's honorary fraternity on November 17. ODK bestows membership on those male undergraduates who have maintained a high scholastic record while serving in an outstanding manner as a leader in University activities, and on those alumni and faculty members who have made signal contributions to the progress of the University.

Omicron Delta Kappa traditionally taps a smaller group of men in its fall ceremony, since most outstanding campus leaders appear during the course of a regular school year, and are subsequently tapped in the spring.

Theta Tau Float in Parade

The G. W. Homecoming Game with the South Carolina Gamecocks on October 27 at Griffith Stadium featured a colorful halftime float contest. The School of Engineering was represented in the contest with the entry sponsored by the Theta Tau Fraternity. Participation by Theta Tau in the parade marked the first Engineering School entry in the all-school competition.

The motif of the Theta Tau entry was the roasting of the South Carolina Gamecock. For a foundation, the float had a Fink-truss bridge, giving a touch of the Engineering School. On the bridge was a table and stool, with a loyal Colonial feasting on a paper mache roasted gamecock. On each side of the float was a sign "Let's Roast the Gamecocks," along with the Theta Tau crest, and the two large characters theta and tau.

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Mason, and past president of the DC chapter of the Association of General Contractors. Among fraternal associations Mr. Tompkins holds membership in Theta Delta Chi and Omicron Delta Kappa.

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there were trestles and bridges build of wood, but the attrition rate in these bridges was high because of occasional fires and deleterious effects of the elements. Experiments had been made with cast iron, but that material was undependable and bridges utilizing cast iron members were constantly falling. Concrete and steel were still in the future, and Latrobe worked with a material he knew was strong in compression, and designed his bridge so that the structure was stressed accordingly. A stone-arch bridge actually becomes stiffer and stronger as it is loaded since the voussoirs, or keystones, which are carefully cut and fitted, are pressed closer together under load. Latrobe, therefore, did a remarkable job with the materials at hand.

It was during this period in the nineteenth century that a number of the most well-known architects and engineers did the work that later made them famous. Latrobe and his assistant, Wendell Bollman, a railroad carpenter and successful truss builder, had for a student and protege, Albert Fink, who later became a genius in the truss field. Then, too, Caleb and Thomas Pratt, James Kirkwood, William Howe, a Massachusetts architect, and John Fowler developed and produced structural designs that bear their names today.

The Thomas Viaduct, once called Latrobe's folly, must now be considered Latrobe's triumph, because that structure designed and built by that great engineer and bridge designer has certainly met the test of time and stands as a monument to those who met and solved the difficult problems of that age and whose designs have been used to build railroad bridges in the United States with a combined length of 4,000 miles in 1950.

PROFESSIONAL SERVICES

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to pursue her career as an engineer, which she began immediately after her marriage by accepting a position as Physical Science Aid in the Radar Testing Laboratory of the Radioactivity Section, the Atomic Physics Division of the National Bureau of Standards.

In spite of her busy scholastic career, Marge has managed to participate in several activities outside of school, including the Daughters of Colonial Wars, the Daughters of the American Revolution, and the Children of the American Revolution, in which she has held state and national offices. Her most recent honor was her selection last month to the position of Secretary of this year's Senior Class, which she will hold until her graduation in May, 1951.

(Continued from page 6)

co-ordination, depending on the short-circuit through current through the gap at its point of installation.

For example, if the expulsion gap-type device is located on a circuit capable of supplying a short-circuit current of but 500 amperes, the one-half cycle of short-circuit current will blow any co-ordination or sectionalizing fuse below a 30-ampere rating; hence, it will restrict fuse co-ordination to the use of only half of the available fuse ratings.

Experience in the industry for many years has shown that the use of efficient valve-type arresters for protection of distribution transformers results in a substantial decrease in the rate of transformer failures, primary-fuse blowing, and the number of interruptions to service, as well as in a reduced hazard to consumers.

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quently the quality of the sound from the loudspeaker.

The video detector being an amplitude detecting device does not require the oscillator to maintain a precise frequency at all times. In that the video IF amplifier is one of very wide bandwidth a reasonable oscillator drift will have essentially no effect on the quality of the picture received.

It is thus seen that the intercarrier system has two principal advantages over the conventional receiver First, but one IF amplifier is required which means less tubes and thus a less expensive receiver. Secondly, it is not necessary to construct a local oscillator compensated to prevent oscillator drift. This, too, means a less expensive receiver.

Both types of receivers are still manufactured but an increasing number of receivers containing this intercarrier system are being built and from all indications this type of receiver will soon become the conventional receiver.

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YOU NEED the confidence that comes from wide experience, whether you intend to be a salesman, designer, researcher, or production man. Confidence based on knowledge is one of the greatest assets an engineer can have. Here is what I mean.


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Offer All-Around Help

Can you help them? Or are you just another peddler who is taking their time when they have problems on their minds. In my work I call on electric utilities, cement plants, machinery builders, textile mills, paper mills, shoe factories and many other types of plants. In each of them, I try to help the engineers and mechanics I call on.

It's a good credo for salesmen, but it takes broad experience to carry it out. It's the kind of experience you must deliberately set about acquiring as early as possible. I had heard of Allis-Chalmers equipment, seen A-C's giant Corliss engines in Australia's biggest power plant and decided to study design at Allis-Chalmers. It looked like the best place in the world to get a broad engineering background.


High temperatures and speeds raise tough design and production problems on giant steam turbine spindles like these.

I joined the Allis-Chalmers Graduate Training Course after graduation from Sydney Technical College in 1908 . . . worked on steam turbines, wound coils of all types, performed tests for the electrical department. After that there were field trips to erect electrical equipment. It was soon apparent that I wasn't a designer at heart, and my sales career started.

Broad Opportunity

Forty-one years later, Allis-Chalmers still offers the same opportunity for broad experience. A-C still builds equipment for electric power, mining and ore reduction, cement making, public works, pulp and wood processing, and flour milling.

And the Allis-Chalmers Graduate Training Course is still flexible. Students help plan their own courses. They can switch to design, manufacturing, research, application, sales, or advertising—divide their time between shops and offices—and can earn advanced degrees in engineering at the same time.

Men at Allis-Chalmers get a close-up of the basic industries. No matter what path they take in the industrial world, experience gained with this broad organization lays a foundation for the confidence that comes with all-around knowledge.


Textile mills are getting adjustable speed at lower cost by using new automatic Vari-Pitch sheaves on spinning frames as shown.

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